FIG. 1

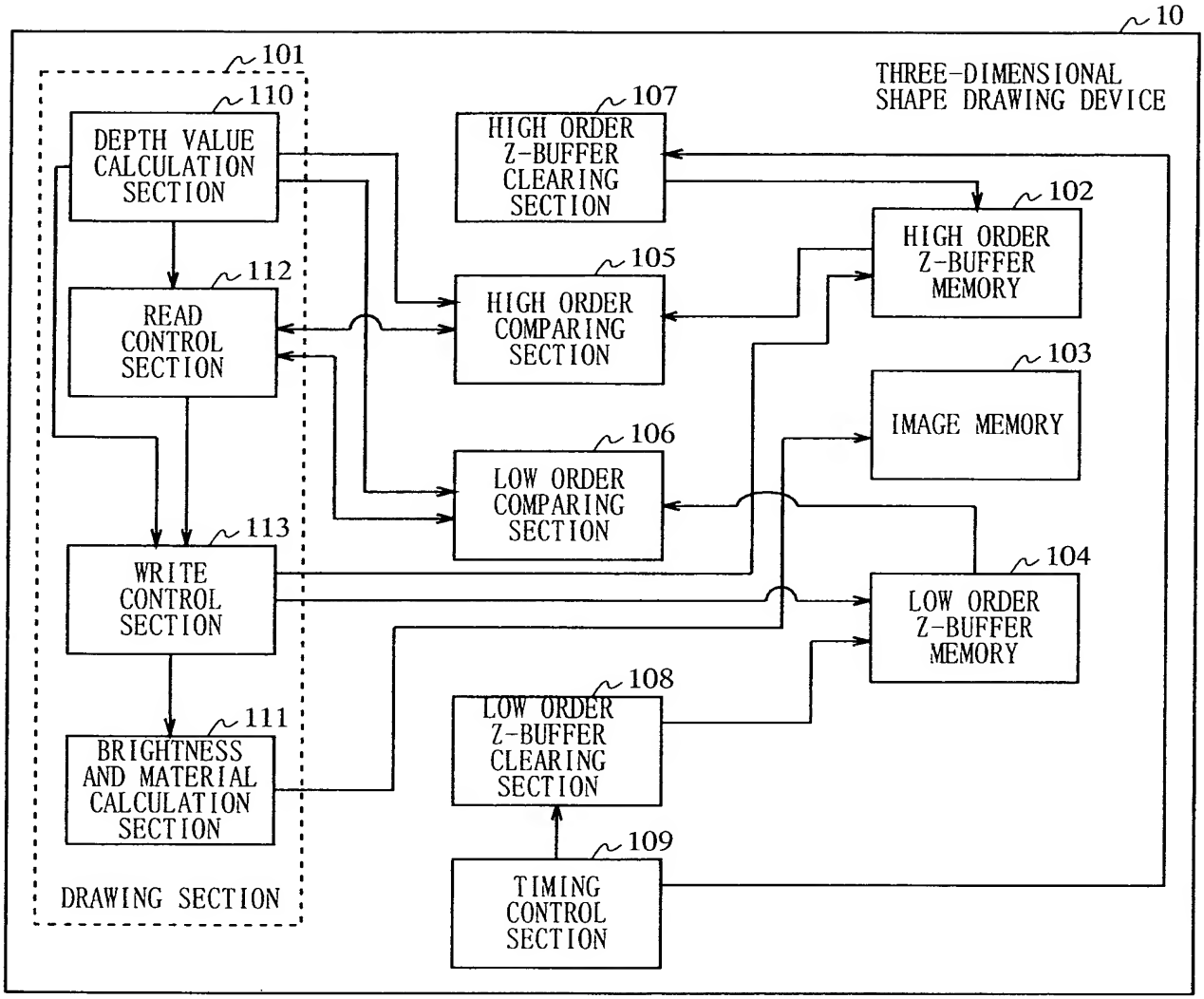

10
THREE-DIMENSIONAL SHAPE DRAWING DEVICE
101
DRAWING SECTION
110
DEPTH VALUE CALCULATION SECTION
112
READ CONTROL SECTION
113
WRITE CONTROL SECTION
111
BRIGHTNESS AND MATERIAL CALCULATION SECTION
107
HIGH ORDER Z-BUFFER CLEARING SECTION
105
HIGH ORDER COMPARING SECTION
106
LOW ORDER COMPARING SECTION
108
LOW ORDER Z-BUFFER CLEARING SECTION
109
TIMING CONTROL SECTION
102
HIGH ORDER Z-BUFFER MEMORY
103
IMAGE MEMORY
104
LOW ORDER Z-BUFFER MEMORY

FIG. 2

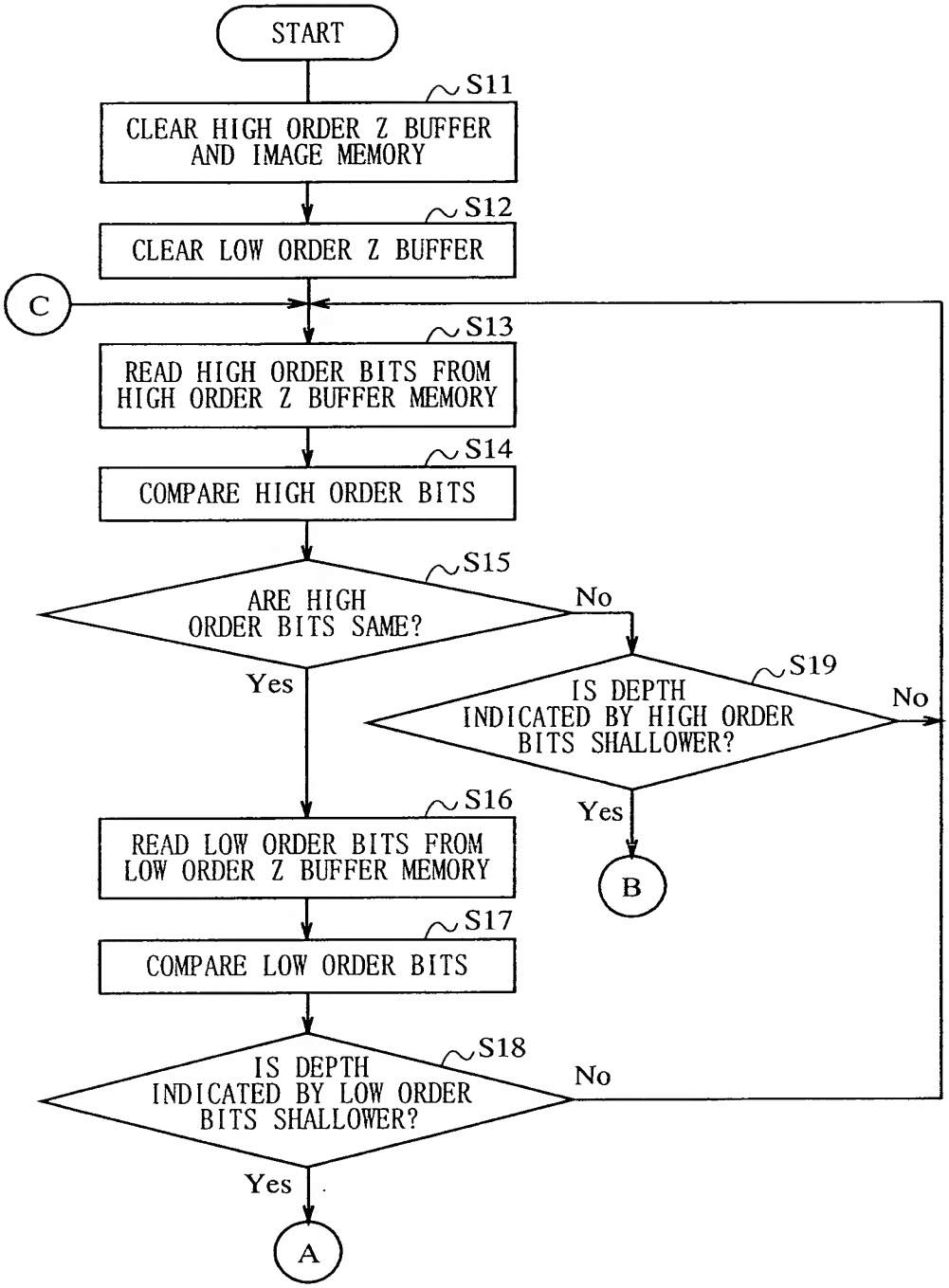

START
S11
CLEAR HIGH ORDER Z BUFFER AND IMAGE MEMORY
S12
CLEAR LOW ORDER Z BUFFER
C
S13
READ HIGH ORDER BITS FROM HIGH ORDER Z BUFFER MEMORY
S14
COMPARE HIGH ORDER BITS
S15
ARE HIGH ORDER BITS SAME?
No
Yes
S19
IS DEPTH INDICATED BY HIGH ORDER BITS SHALLOWER?
No
Yes
B
S16
READ LOW ORDER BITS FROM LOW ORDER Z BUFFER MEMORY
S17
COMPARE LOW ORDER BITS
S18
IS DEPTH INDICATED BY LOW ORDER BITS SHALLOWER?
No
Yes
A

FIG. 3

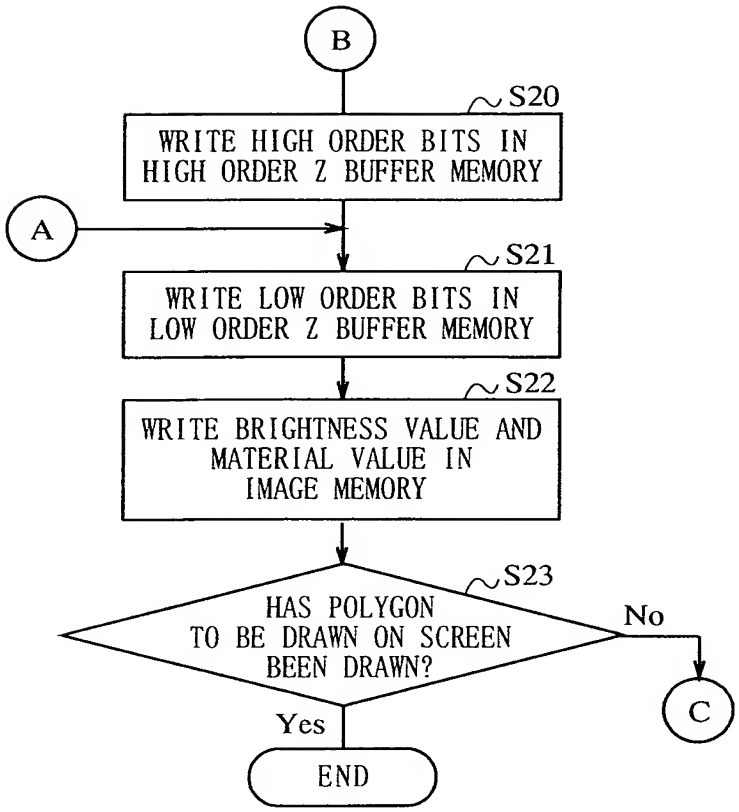

B
S20
WRITE HIGH ORDER BITS IN HIGH ORDER Z BUFFER MEMORY
A
S21
WRITE LOW ORDER BITS IN LOW ORDER Z BUFFER MEMORY
S22
WRITE BRIGHTNESS VALUE AND MATERIAL VALUE IN IMAGE MEMORY
S23
HAS POLYGON TO BE DRAWN ON SCREEN BEEN DRAWN?
No
C
Yes
END

FIG. 4

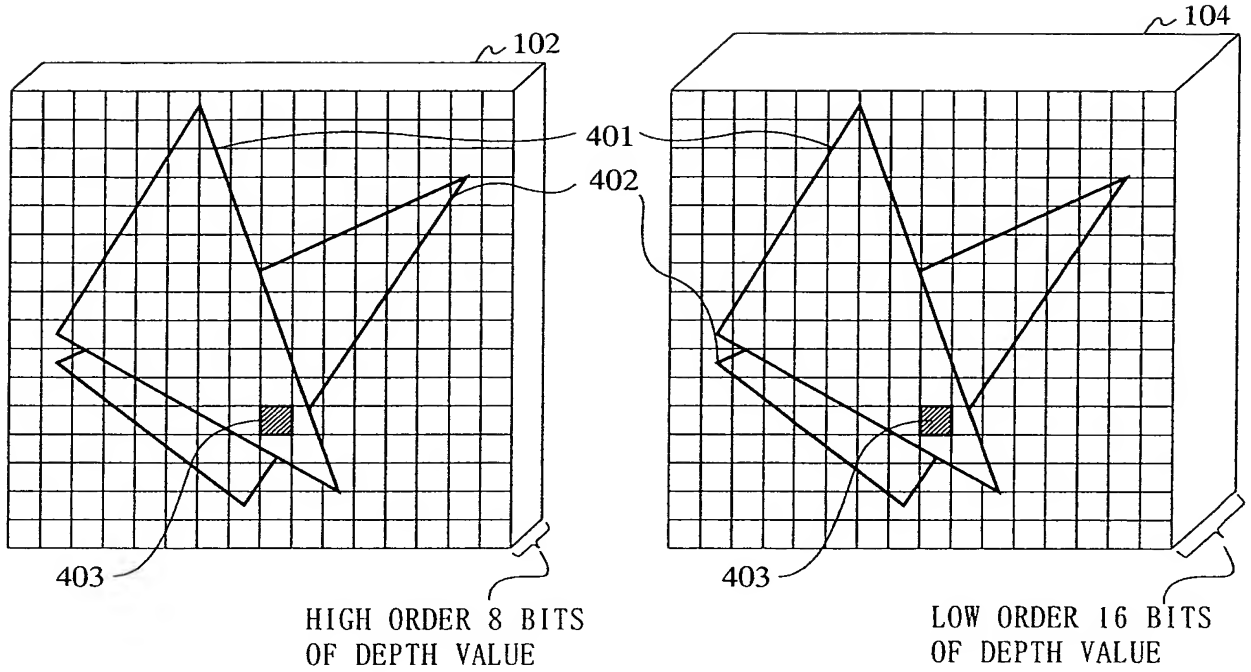

102
104
401
402
403
403
HIGH ORDER 8 BITS
OF DEPTH VALUE
LOW ORDER 16 BITS
OF DEPTH VALUE

FIG. 5

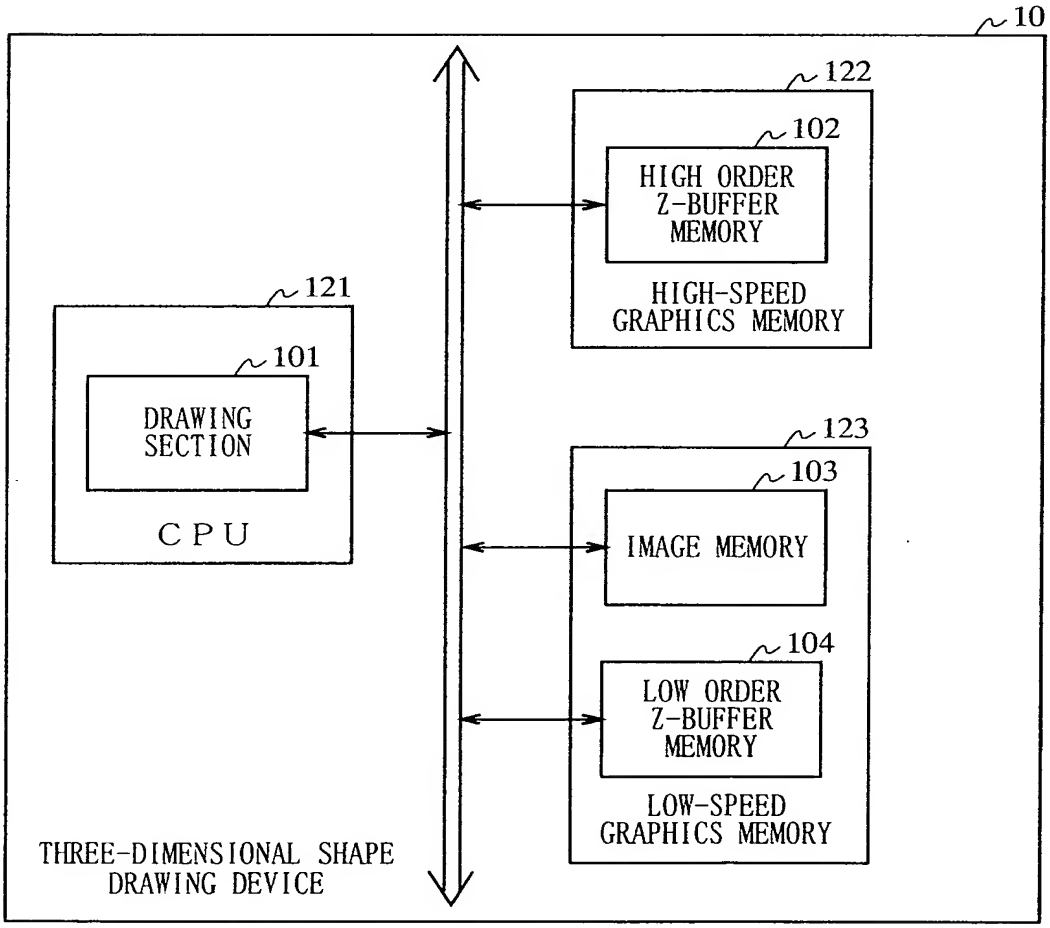

10
122
102
HIGH ORDER
Z-BUFFER
MEMORY
HIGH-SPEED
GRAPHICS MEMORY
121
101
DRAWING
SECTION
CPU
123
103
IMAGE MEMORY
104
LOW ORDER
Z-BUFFER
MEMORY
LOW-SPEED
GRAPHICS MEMORY
THREE-DIMENSIONAL SHAPE
DRAWING DEVICE

FIG. 6

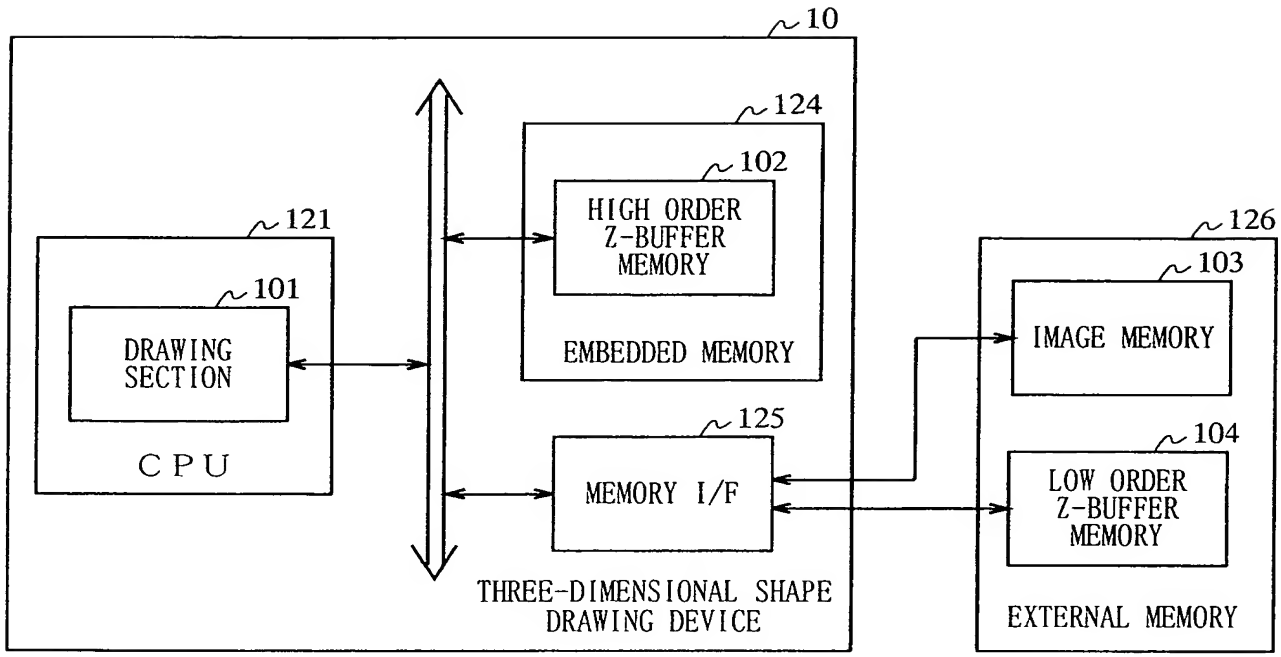

10
124
102
HIGH ORDER
Z-BUFFER
MEMORY
EMBEDDED MEMORY
121
101
DRAWING
SECTION
CPU
125
MEMORY I/F
THREE-DIMENSIONAL SHAPE
DRAWING DEVICE
126
103
IMAGE MEMORY
104
LOW ORDER
Z-BUFFER
MEMORY
EXTERNAL MEMORY

FIG. 7

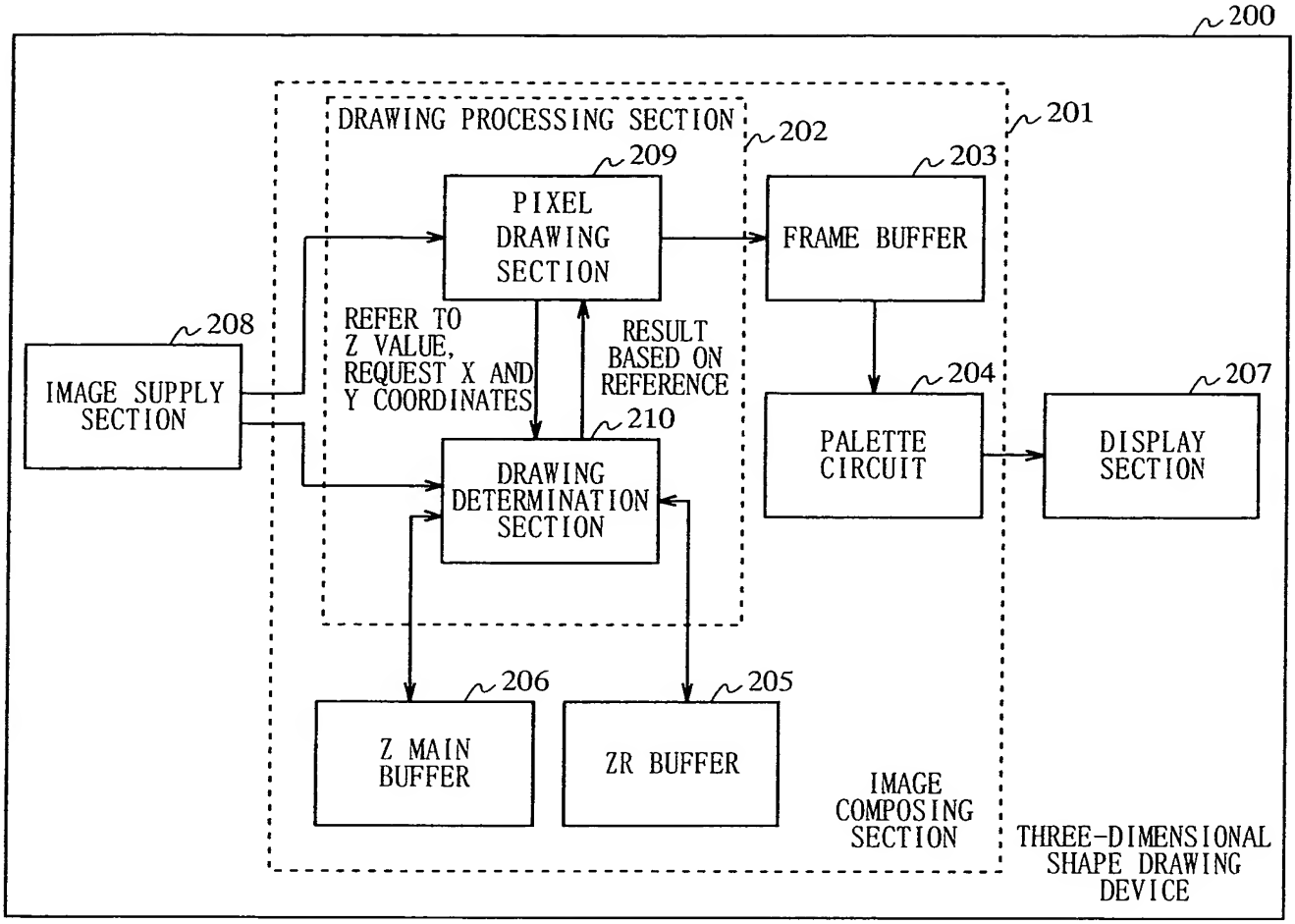
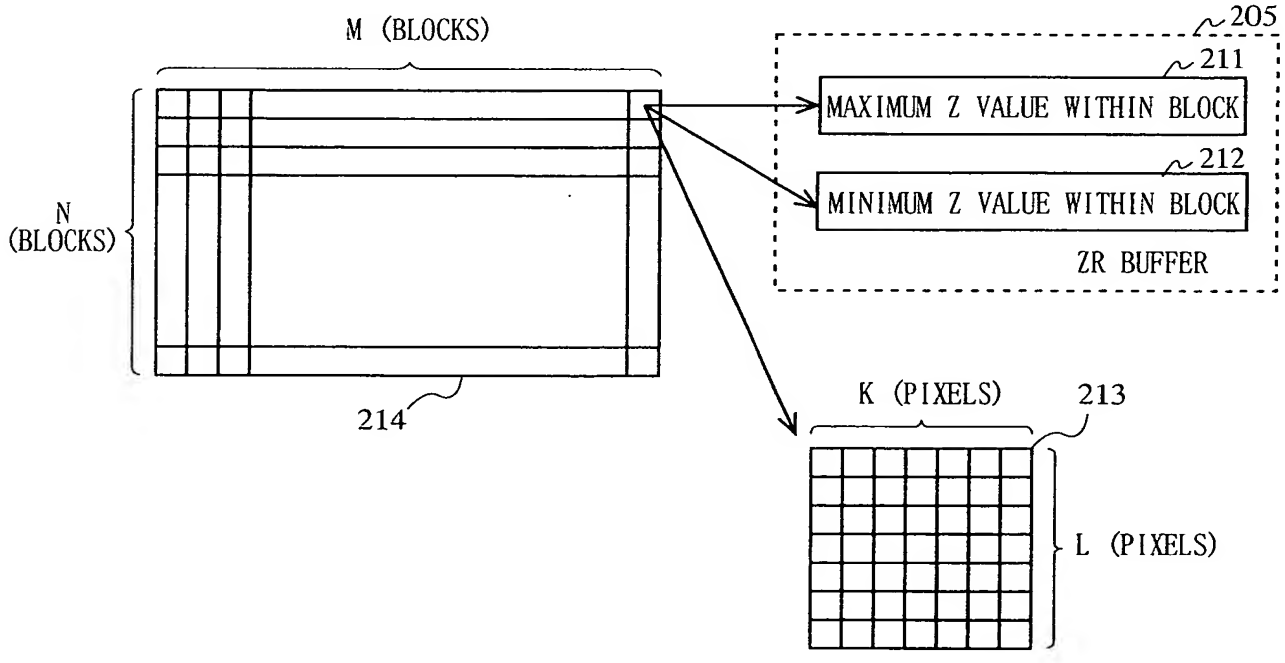

200
DRAWING PROCESSING SECTION
202
201
209
PIXEL DRAWING SECTION
203
FRAME BUFFER
208
IMAGE SUPPLY SECTION
REFER TO Z VALUE, REQUEST X AND Y COORDINATES
RESULT BASED ON REFERENCE
210
204
207
PALETTE CIRCUIT
DISPLAY SECTION
DRAWING DETERMINATION SECTION
206
205
Z MAIN BUFFER
ZR BUFFER
IMAGE COMPOSING SECTION
THREE-DIMENSIONAL SHAPE DRAWING DEVICE

FIG. 8


M (BLOCKS)
N (BLOCKS)
214
205
211
MAXIMUM Z VALUE WITHIN BLOCK
212
MINIMUM Z VALUE WITHIN BLOCK
ZR BUFFER
K (PIXELS)
213
L (PIXELS)